

## **Arkema Project Area PDI Work Plan Comment Resolution Approach**

### **Summary and Tentative Agreements from the LSS/EPA Meeting on September 30, 2020**

This document briefly summarizes the Legacy Site Services LLC (LSS), agent for Arkema Inc., planned resolution for addressing key comments from the U.S. Environmental Protection Agency (EPA) team on the pre-design investigation (PDI) work plan for the Arkema Project Area. The meeting was held on September 30, 2020, and covered the following topics: 1) groundwater plumes and flux to the river, 2) riverbank soil sampling, 3) sediment sampling approach, and 4) nonaqueous-phase liquid (NAPL) delineation.

The following sections briefly summarize each topic and the tentative agreements reached during the meeting. LSS understands that the EPA team will need to evaluate the tentative agreements before committing to them. LSS appreciates the opportunity to discuss these topics and looks forward to working with the EPA team to complete the Arkema Project Area PDI work plan.

### **Groundwater Plumes and Flux to the River**

LSS's proposed approach to evaluating groundwater discharge is to focus on the flux to the river and the assessment of concentrations of contaminants of concern (COCs) in groundwater at the point of discharge using seepage meters, which is consistent with groundwater remedial action objectives (RAOs) from the Portland Harbor Record of Decision (ROD; RAOs 4 and 8). Regarding Arkema's groundwater source control, LSS will be implementing a groundwater extraction enhancement (GEE) in 2021 that is anticipated to achieve and sustain inward hydraulic gradients.

Details of the groundwater discharge approach are as follows:

- Seepage meter station locations will be evaluated and expanded
  - Groundwater monitoring will be proposed in the final work plan at select locations near the top of the bank adjacent to the Arkema site in the first quarter of 2021, and the data will be used to refine and assess additional seepage meter locations.
  - The GS Roofing SCE data will be presented in the PDI work plan to the extent available and evaluated for data gaps. Additional riverbank soil sampling will

be proposed in the work plan if data gaps are identified. Supplemental GS Roofing data may be needed at later stages in the PDI/remedial design if conditions change.

- Bayer's recent (2018) groundwater data on Lots 1 and 2 and the riverbank area will be evaluated in the work plan. Seepage meter stations in the Lot 1 and 2 Reach will be proposed in the work plan to assess current flux conditions.
- Seepage meters will be deployed in Q3 2021 when the river stage is low and the hydraulic gradient between the upland site and the river is maximized.
- The groundwater and porewater samples will be analyzed for the groundwater COCs listed in Tables 17 and 21 of the Portland Harbor ROD. In addition to the ROD groundwater COCs, chloride and chloroform will be analyzed in groundwater and porewater samples in accordance with EPA's recommendations.

Seepage meter data will be used to inform sediment cap design.

## **Riverbank Soil Sampling**

LSS acknowledges that additional riverbank soil sampling may be needed. The work plan will be updated to show existing riverbank soil data with proposed sample locations to evaluate data gaps. Details of the riverbank soil sampling approach are as follows:

- The GS Roofing SCE data will be presented in the PDI work plan to the extent available and evaluated for data gaps. Additional riverbank soil sampling will be proposed in the work plan if data gaps are identified. Some additional riverbank soil sampling may be needed after the Sufficiency Assessment has been conducted because the GS Roofing SCE is ongoing.
- The Riverbank Guidance Document provides some flexibility in the COC list. The riverbank COCs will be evaluated in the work plan.
- Riverbank fill and the related detail of the dispute resolution will be acknowledged in the work plan and considered throughout the sediment design process.
- The riverbank sampling will be conducted using a hand-auger in Phase I. Additional sampling may be needed in an additional phase to get to the bottom of the contamination using methods such as a long-reach excavator or angled borings with a sonic drill rig.

## Sediment Sampling Approach

An alternate sampling scheme has been developed based on a 150-ft grid to address the EPA team comments. The conceptual map in Attachment 1 shows the revised proposed sediment core stations for Phase I. The boundary of the Arkema Project Area is defined based on 150-ft sampling and step outs as needed based on the Phase I sampling results. Sediment cores have been added along the navigation channel to create a maximum 150-ft spacing with step out criteria. In areas where dredging is the presumptive remedy (e.g., between Docks 1 and 2), reduced sediment sampling will be conducted as needed for defining the limits in the interior of the dredge area.

Surface sediment sampling is not proposed for the Phase I investigation. The need for surface sediment sampling will be assessed later in the design process and will only be recommended for areas where dredging is not anticipated. Surface sediment sampling is not necessary for areas that are targeted for dredging because the sediment will be removed.

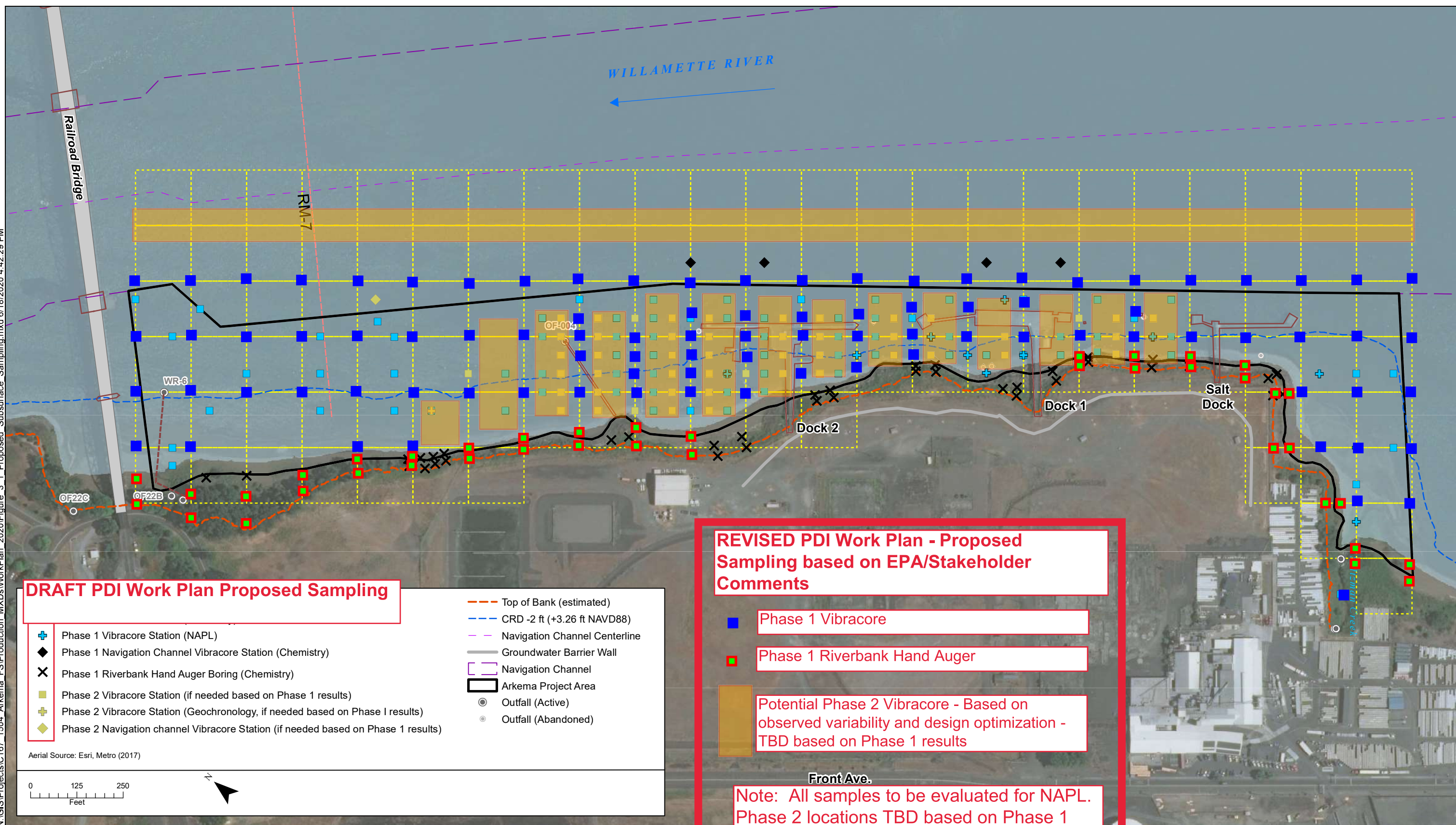
## NAPL Delineation

LSS acknowledges that the area between Docks 1 and 2 has chlorobenzene concentrations in sediment that exceed the principal threat waste (PTW) threshold (320 µg/kg; see Figure 2-2g from the work plan for cores with chlorobenzene above the PTW threshold). In addition, the area between the docks is generally collocated with the borings with sheens or NAPL according to Figure 1 of CDM's NAPL memo. This area is anticipated to be dredged, so characterization of NAPL and chlorobenzene will focus on evaluating the maximum depth of contamination. The sediment above the maximum depth of contamination in this area will be evaluated for dredging and the associated waste characterization. The assessment of NAPL or sheens will focus on the areas upstream and downstream of the Dock 1 and 2 Area.

All sediment cores will be screened for visual sheens or NAPL. Visual observations are simply a screening step. Sheens or blebs alone do not equate to NAPL presence; hence the need for a multiple lines of evidence approach to positively identify NAPL. Samples with sheens or blebs collected from areas upstream and downstream of the Dock 1 and 2 area will be analyzed for chemistry (e.g., TPH, VOCs, PAHs). If there is sufficient sample volume of a separate NAPL, physical properties will be quantified.

Although, based on our CSM, there are no known or suspected sources of non-chlorobenzene NAPL adjacent to the Arkema site, non-chlorobenzene NAPL will still be investigated in the PDI. Chemical analyses will be used to distinguish between chlorobenzene- and non-chlorobenzene NAPLs. All PTW, regardless of whether it is based on dissolved-phase chlorobenzene or NAPL, will be addressed in the sediment design process.

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**Figure 3-1. (Proposed Revisions)**  
Summary of Proposed Remedial Design Investigation Subsurface Sediment and Riverbank Soil Chemistry Sampling Stations  
Arkema Project Area Pre-design Investigation Work Plan